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ABSTRACT

This paper examines the use of the microcomputer as a mediating device, and explores its influence on curriculum. The relationship of a media device to subject matter and the nature of a subject are examined, and possible uses of the computer in science and social studies are analyzed to illustrate this principle. Three main points are emphasized and discussed: (1) the mediating device used in a course makes a statement about the nature of a subject; (2) the device requires the use of a set of skills; and (3) it transmits a set of values. It is concluded that if the nature, skills, and values of the subject are incongruent with those transmitted by the medium, the device should not be used. Four references are listed. (Author/LMM)

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COMPUTERS AND CURRICULUM: WHAT'S THE FUSS?

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ABSTRACT

Computers and Curriculum: What's the Fuss?

This paper examines the use of the microcomputer as a mediating device, and explores its influence on curriculum. It examines the relationship a media device has to subject matter and the nature of a subject. The possible uses of the computer in science and social studies are analyzed to illustrate this principal.

The presentation is intended to illustrate three points and offer a conclusion. The mediating device used in a course: (1) makes a statement about the nature of a subject; (2) requires the use of a set of skills; and (3) transmits a set of values. If the nature, skills, and values of the subject are incongruent with the nature, skills, and values transmitted by the media, then the device should not be used.

BRIEF BIOGRAPHY

Gene E. Rooze is a Professor of Education at Texas Tech University in the elementary teacher education program. Dr. Rooze presently serves on the Board of Directors of the Texas Computer Education Association. He has published several articles and four books. He is the co-author of a forth-coming book

Entitled Educational Computing: Current Status and Future Directions.

Gene E. Rooze

Computers and the Curriculum: What's the Fuss?

This paper examines the use of the computer as a mediating device, and explores its influence on curriculum. We will examine the relationship a media device has to subject matter and the nature of a subject.

An accepted definition of curriculum is: those planned experiences obtained under the auspices of the school. Those experiences involve subject matter: knowledge, skills, and values, usually called course content. This content is what schools transmit to students.

Experiences are obtained through instruction: a set of teacher actions (TA), using some mediating device (M), allowing student actions (SA) which produce a resultant outcome. This is illustrated in the diagram below:

Content $\longrightarrow$ TA + M + SA $\longrightarrow$ Resultant Outcome

A significant point is that changing any one of these components influences the outcome of learning. Therefore, the selection of a mediating device does make a difference. It effects both the teacher actions and student actions. Each mediating device: programmed

learning, textbooks, films, or microcomputers affects the resultant outcome.

Possibly the best illustration of this principle is the use of the textbook as a mediating device. There are several advantages to the textbook. First, textbooks are fairly cheap because they can be used repeatedly. A second advantage is that they contain information and commonly, student activities that can be used by teachers of varying skill levels. A beginning teacher can use the teachers guide, verbatim, and get similar results as compared to an experienced teacher. Third, textbooks allow a standardization of presentation that can be built upon from year to year. And finally, they are readily available since they are the traditional medium of instruction.

There are several curriculum concerns that make the textbook a poor mediating device. First, it calls for an active teacher role and a passive student role. Second, the use of a textbook often involves the memorization of facts, concepts, and principles. The way it is used frequently allows little analysis or creative thought. Third, the textbook approach can transmit the idea that knowledge is fixed--the exploration of new knowledge and the solution of social problems should be left to the experts.

This presentation is intended to illustrate three points and offers a conclusion. The mediating device used in a course: (1) makes a statement about the nature of a subject; (2) requires the use of a set of skills; and (3) transmits a set of values. If the nature, skills, and values of the subject are incongruent with nature, skills, and values transmitted by the media, then the device should not be used.

Haney (1982) presents the conflict between subject matter and media presentation. Haney feels the microcomputer is a natural in the science curriculum. It removes tedium and releases the mind for analysis and evaluation. But used incorrectly, it can move science away from its intended goal, teaching science is a process of learning about the physical world.

An analysis of selected applications, Table I, illustrates Haney's point. The nature of science is intended to be disciplined inquiry. This inquiry is focused upon the natural world. One can explain this world through an analysis of physical data. After such an analysis conclusions can be drawn and explanations developed.

The indiscriminate use of drill and practice software portrays science as a subject matter rather than a process of inquiry. Some information can be

presented. Some skills must be taught, but a constant diet of expository presentation and unapplied skills lessons grossly misrepresents this curricular area.

Computerized data bases and retrieval systems are beneficial, but here too constant use would present an incorrect concept of science to the student. Science is, after all, the study of the natural world; a computer is not the natural world. The use of prepared data bases also take away some decision making possibilities: What data is needed? How should it be organized? Such choices predetermine the results achieved and insert possibilities of error which may be unchallenged. The use of data bases may promote a misconception common in the use of textbooks: Its in the data base; it must be true!

While some use of simulation is recommended, cautions are in order. The purpose of simulation is to recreate the essential elements of a phenomena, eliminating only the dangerous or distracting elements of the situation. Simulations were never intended to replace real experience. They are the next best substitute. With the schools' need for decreasing expenditures, similations have been promoted as real experience. Again, science is an attempt to study and understand nature. Does an experiment on the computer

promote this conception? The question of purpose must be faced squarely.

Table I
Comparative Influences of Applications of Computers Upon Science and Social Studies

	Advantages	Disadvantages
Science		
Drill and practice:	Learn about science and practice science skills.	Science is process and not content.
Computerized Data Base:	Ready access to data.	Science is observation of nature.
	Increased ability to process data.	Decision making needs to be in hands of student.
Simulation:	Can be used where real experimentation is impracticable.	Danger of overuse. Experimentation is what is important.
	Cheaper than lab equipment.	Savings on equipment to expense of science.
Social Studies		
Drill and practice:	Learn about social studies and social studies skills.	Social studies as content compared to social studies as process.
Computerized Data Base	Uses data processing skills.	Current service cost $25 to $65 per hook up.
Simulation:	Uses cause and effect. Students able to ask "what-if" and can see results. Allows experimental situations not available previously. Allows students to prepare and test models.	Used as games children play without lead-up and analysis. No higher thinking and learning.

Roberts (1982)looks at the effects the computer can have in social studies. We will examine the same applications we used to analyze computer applications to science. Again we will consider the way the mediating device makes a statement about the nature of the subject, the required skills, and the values it transmits.

The use of drill and practice is common in social studies. Essentially this has been the approach used. It is quite similar to the textbook. This application fixes social studies content in the static mold. Generally skills are taught and drilled with little thought given to their application.

Social science, the disciplines which are the foundations of social studies has generally been thought of as the "world of words." Actually the social sciences have become nearly as number conscious as the physical and natural sciences. Data analysis is important to solving social problems. One of the goals of social studies is social sciencing; this requires data analysis. In addition, the microcomputer provides access to data bases previously unavailable. This change allowed by the computer may well make social studies a more vital part of the curriculum.

While simulation is a substitute for real experience in science, it is welcome alternative in social studies. Often the sciencing done in social studies cannot be accomplished in the real world. The exploration of the cause and effect, the asking of "what-if" questions can not take place in the classroom. Simulation (Roberts, 1978) may be the answer for social studies. This could change the nature of social studies in the classroom and explode the "fixed-knowledge" syndrome presently transmitted.

The purpose of this presentation was to illustrate three points and offer a conclusion. The mediating device used in a course: (1) makes a statement about the nature of a subject; (2) requires the use of a set of skills; and (3) transmits a set of values. The examples presented illustrate these points. It should be evident that the selection of the computer and specific software applications will influence the nature, skills, and values of the subjects illustrated. The question presented to curriculum specialists is: What nature, skills, and values should be transmitted? Once this determination is made then the decision then the next decision should be, is the computer the best device to accomplish these goals?

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